Computational Analysis and Classification of Road Surface using Naïve Bayes Classifiers

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Abstract. Road becomes one of the main paths for land transportation, therefore the quality of the road plays a big role in order to achieve the convenience and safety for the community. This research works on a solution to identify the quality of road into two categories (smooth and rough). The datasets are made possible by Phyphox mobile application producing up to 300 datasets. The extracted datasets originally have three axis such as x-axis, y-axis, and z-axis graphs. After conducting individual and multiple axis with combination of scenarios, it is found that the combination of y-axis and z-axis scenario is the best fit for current experiment. The methods that are being proposed include the classification models under Naïve Bayes classifiers. The models include Gaussian Naïve Bayes, Multinomial Naïve Bayes with Min-max scalar, Complement Naïve Bayes with Min-max scalar, Multinomial Naïve Bayes with absolute number, and Complement Naïve Bayes with absolute number. The accuracy of all models are being calculated and compared in this paper. Nevertheless, the Complement Naïve Bayes with Min-max scalar shows the best accuracy value up to 91.4% and 91.6% for model validation and performance measurement respectively.

Keywords: road surface, Naïve Bayes, classification, accelerometer

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